

## **REMARKS**

As an initial matter, Applicants thank the Examiner for the telephonic interview held on July 2, 2008, during which the present application and the prior art were discussed.

Claims 2-19, 21-30, 55, 56, 58, 60, and 62-67 are presently under final rejection. Claims 62-67 are presently amended. These amendments do not contain any new matter. Support for these amendments may be found at, *e.g.*, paragraphs [0028]-[0030], [0051], and [0071], and also at **FIG. 4b** of the present application.

Applicants submit that upon entry of the requested amendments, the pending claims are allowable. Applicants traverse the pending rejections and submit that the pending rejections are improper and should be reconsidered and withdrawn.

### **I. Rejections Under 35 U.S.C. § 102(b)**

The Office Action alleges at page 3 that claims 2, 9, 10-12, 15, 16, 18, 21, 27, 30, 62, 63, 65, and 66 are anticipated by U.S. Patent 4,812,329 to Isenberg (“Isenberg”). Applicants respectfully disagree and submit that the cited claims are allowable.

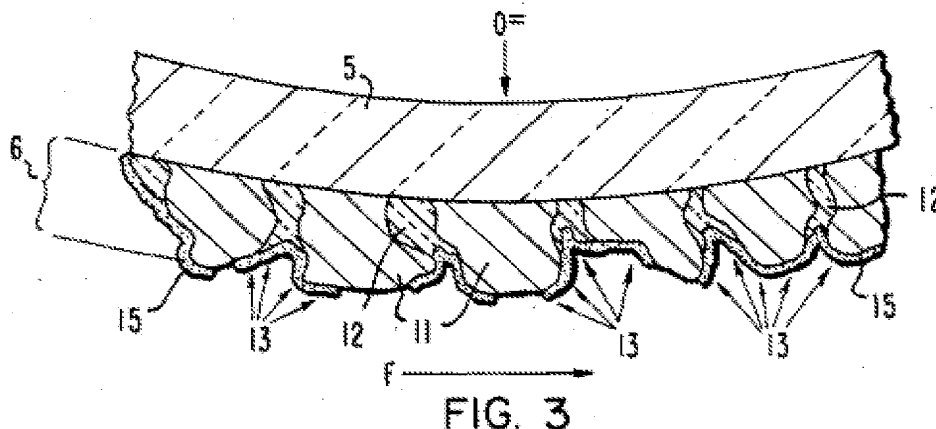
#### **A. Legal Standard**

As set forth in MPEP § 2133, a rejection under 35 U.S.C. § 102(b) requires that “the invention was patented . . . in this or a foreign country . . . more than one year prior to the date of application for patent in the United States.” Anticipation exists only when the cited reference discloses all of the elements, features, or limitations of the claimed invention. *Carella v. Starlight Archery and Pro Line Co.*, 804 F.2d 135, 138 (Fed. Cir. 1986). Furthermore, “[t]here must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention.” *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991).

#### **B. Discussion**

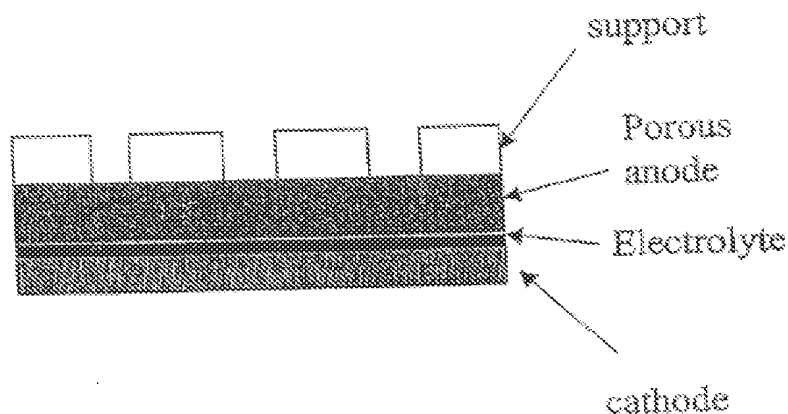
Applicants submit that Isenberg does not anticipate claims 62, 63, 65, and 66 because that reference does not disclose every element of these claims. Each of the cited claims discloses, *inter alia*, that “the porous anode layer and solid electrolyte contact one another along an essentially continuous interface.” This element, however, is not taught by Isenberg.

FIG. 3 of Isenberg is useful in clarifying the distinctions between that reference and the present invention. For convenience, that figure is reproduced below:



This figure depicts “[an] electrode (6) bonded to a solid, ion-conducting electrolyte (5). The electrode comprises particles of electronic conductor (11) partly embedded in a skeletal member of a ceramic oxide (12). The particles and skeleton are covered, preferably completely, with an ionic-electronic conductor material (15). This coating layer (15) can be dense or porous” (Isenberg at col. 4, ll. 46-52). Thus, the porous material (15) lacks *any* interface with the electrolyte (5) and hence lacks any bonding to the electrolyte. To the extent that the skeletal material (12) has any interface with the electrolyte (5), the skeletal material is not present in the form of a layer, and any such interface is *discontinuous* and interrupted by the metallic particles (11).

By contrast, the present invention teaches devices where, *inter alia*, “the solid electrolyte and the composite anode in physical contact with one another, essentially the entirety of the physical contact between the solid electrolyte and the [composite] anode comprising physical contact between the solid electrolyte and the porous ceramic of the [composite] anode.” This is illustrated by, *e.g.*, FIG. 4b of the present application. That figure is reproduced below for ease of reference:



As shown above, in the present invention the porous ceramic material of the porous anode layer and the electrolyte of the present invention are in physical contact with one another at their interface. By contrast, Isenberg describes metallic particles disposed *between* an electrolyte layer and the porous components of an anode, which particles in fact *separate* the porous layer from the electrolyte (*see FIG. 3* of Isenberg). Accordingly, because Isenberg does not teach that the solid electrolyte and the composite anode are in physical contact with one another such that the physical contact between the solid electrolyte and the composite anode comprising physical contact between the solid electrolyte and the porous ceramic of the composite anode, Isenberg does not anticipate claims 62, 63, 65, and 66, and the novelty rejections are improper and should be withdrawn. *See Starlight Archery*, 804 F.2d at 138; MPEP § 2133.

Furthermore, because Applicants' independent claims 62, 63, 65, and 66 are not anticipated by Isenberg, claims that depend from those independent claims are not anticipated by Isenberg. *See RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 1446 (Fed. Cir. 1984) ("since claim 3 of the Cole patent is dependent upon claim 2, which is not anticipated, claim 3 cannot be anticipated."). Accordingly, the rejections of those claims should likewise be withdrawn.

## II. REJECTIONS UNDER 35 U.S.C. § 103(a)

The Office Action alleges that several of Applicants' claims are obvious in light of various references and combinations of references. Applicants respectfully disagree and traverse each of these rejections in turn.

### A. Legal Standard

To establish a *prima facie* case of obviousness, there must be a clearly articulated reason or rationale, either in the prior art itself or in the knowledge generally available to one of ordinary skill in the art, why the claimed invention is obvious in light of a reference or combined reference teachings. MPEP §§ 2143, 2143.01; *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739-43, 82 U.S.P.Q.2d 1385, 1395-97 (2007). There must also be a reasonable expectation of success. MPEP § 2143.02. Further, the prior art combination must address every element of the claim at issue. MPEP § 2143.03. The rationale to make the claimed combination and the reasonable expectation of success must be found in the prior art and not be based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 493 (Fed. Cir. 1991).

### B. Discussion

#### 1. Rejections of Claims 2, 9, 10-12, 15, 16, 18, 21, 27, 30, 62, 63, 65, and 66 in Light of Isenberg

The Office Action alleges that claims 2, 9, 10-12, 15, 16, 18, 21, 27, 30, 62, 63, 65, and 66 are obvious in light of Isenberg. Applicants respectfully disagree and submit that because Isenberg proposes a qualitatively different device than Applicants' device, Isenberg fails to address every element of Applicants' independent claims 62, 63, 65, and 66.

More specifically, Isenberg fails to disclose that essentially the entirety of the physical contact between the solid electrolyte and the composite anode comprises physical contact between the solid electrolyte and the porous ceramic of the composite anode or otherwise suggest or contemplate this element of Applicants' claims. As shown in Isenberg **FIG. 3**, particles (11) of an electronic conductor – such as a metal – are disposed along an electrolyte (5). These particles are held in place on the electrolyte (5) by a skeletal member (12), and the particles (11) and the skeletal member (12) are at least partially covered by a porous layer (15). Thus, the electronically-conductive material is present in the form of particles disposed between a porous layer (15) and the electrolyte (5). Accordingly, Isenberg describes only devices wherein particles of metal are disposed between a porous layer and an electrolyte.

Such a construction, however, does not contemplate the claimed invention, wherein an electronically-conductive material is disposed *within the pores* of an anode layer that is itself *directly adjacent* to the electrolyte (*see, e.g., FIG. 4b* and paragraph [0077] of the present application). Accordingly, Isenberg fails to describe, suggest, or otherwise contemplate every element of Applicants' claims 62, 63, 65, and 66

Because Isenberg fails to address every element of Applicants' claims 62, 63, 65, and 66, Isenberg fails to establish that claims 62, 63, 65, and 66 are *prima facie* obvious. Accordingly, the rejection of claims 62, 63, 65, and 66 should be reconsidered and withdrawn. MPEP § 2143; *In re Vaeck*, 947 F.2d at 492. Because the rejections of claims 62, 63, 65, and 66 are improper and should be withdrawn, the obviousness rejections of all dependent claims related to claims 62, 63, 65, and 66 – *i.e.*, claims 2, 9, 10-12, 15, 16, 18, 21, 27, and 30 – should likewise be withdrawn and such dependent claims should be allowed. *See In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) (a claim depending from a non-obvious independent claim is itself nonobvious).

**2. Rejections of Claims 3, 5-8, 22, 24-26, 28, and 29 in Light of Isenberg and in Further View of Keegan**

The Office Action alleges at page 7 that claims 3, 5-8, 22, 24-26, 28, and 29 are obvious in light of Isenberg as applied to claims 62, 2, 63, and 21, in further view of U.S. Patent 6,423,896 to Keegan ("Keegan"). Applicants respectfully disagree on the ground that independent claims 62 and 63 are non-obvious in light of Isenberg as explained in section II.B.1 of this submission, and that any claims that depend from these non-obvious independent claims are themselves non-obvious. *In re Fine*, 837 F.2d at 1076. Accordingly, the rejections of claims 3, 5-8, 22, 24-26, 28, and 29 should be withdrawn.

**3. Rejections of Claims 4, 13, 14, and 23 in Light of Isenberg and in Further View of Keegan and Anumakonda**

The Office Action alleges at page 8 that claims 4, 13, 14, and 23 are obvious in light of Isenberg as applied to claims 62, 2, 10-12, and 21, in view of Keegan as applied to claims 2 and 22, in further view of U.S. Patent 6,221,280 to Anumakonda ("Anumakonda"). Applicants respectfully disagree on the ground that independent claims 62 and 63 are non-obvious in light of Isenberg as explained in section II.B.1 of this submission, and that any claims that depend from these non-obvious independent claims are themselves non-obvious.

*In re Fine*, 837 F.2d at 1076. Accordingly, the rejections of claims 4, 13, 14, and 23 should be withdrawn.

**4. Rejections of Claims 17 and 19 in Light of Isenberg and in Further View of Wallin**

The Office Action alleges at page 11 that claims 17 and 19 are obvious in light of Isenberg as applied to claims 62, 2, 10-12, and 21, in view of U.S. Patent 6,017,647 to Wallin (“Wallin”). Applicants respectfully disagree on the ground that independent claims 62 and 63 are non-obvious in light of Isenberg as explained in section II.B.1 of this submission, and that any claims that depend from non-obvious independent claims are themselves non-obvious. *In re Fine*, 837 F.2d at 1076. Accordingly, the rejections of claims 17 and 19 should be withdrawn.

**5. Rejections of Claims 55, 56, 58, and 60 in Light of Isenberg and in Further View of Cable**

The Office Action alleges at page 12 that claims 55, 56, 58, and 60 are obvious in light of Isenberg, as applied to claims 62, 63, 65, and 66 and in further view of U.S. Patent 5,589,285 to Cable (“Cable”). Applicants respectfully disagree on the ground that independent claims 62, 63, 65, and 66 are non-obvious in light of Isenberg as explained in section II.B.1 of this submission, and that any claims that depend from these non-obvious independent claims are themselves non-obvious. *In re Fine*, 837 F.2d at 1076. Accordingly, the rejections of claims 55, 56, 58, and 60 should be withdrawn.

**6. Rejections of Claims 64 and 67 in Light of Isenberg and in Further View of Cable**

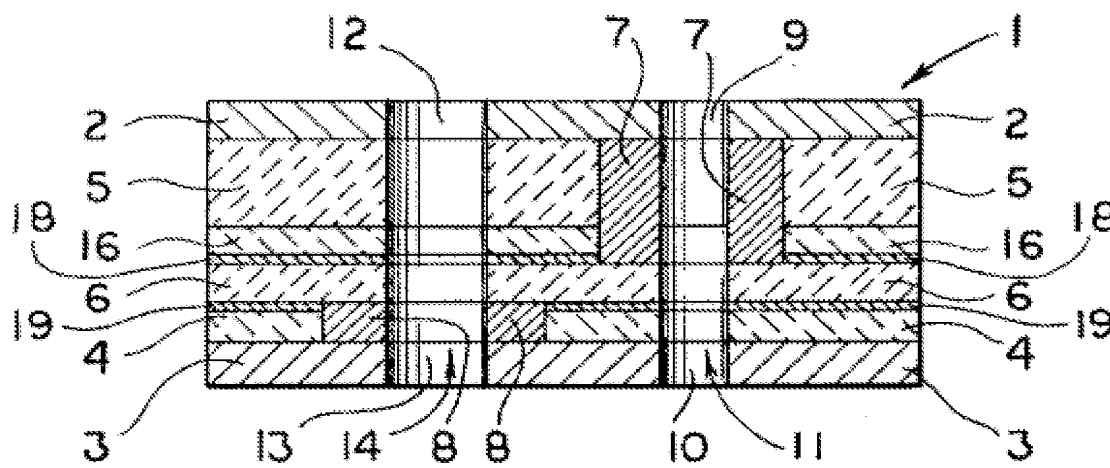
The Office Action alleges at page 13 that claims 64 and 67 are obvious in light of Eisenberg and in further view of Cable. Applicants respectfully disagree on the ground that application of Cable to the present invention is improper and that the combination of Isenberg and Cable does not contemplate every element of Applicants’ claims.

Applicants first submit that Cable may not be properly applied in combination with Isenberg because Cable explicitly criticizes the approach of Isenberg, and the MPEP makes clear that references which teach away from their combination can not be combined. Cable *explicitly* criticizes the approach of Isenberg – *i.e.*, constructing fuel cells wherein “electronic conductors (metals)” are bonded to an electrolyte – on the grounds that (1) such cells experienced “performance loss” when exposed to sulfide-containing fuel and (2) extended

operation of such cells caused mechanical degradation of the anode and “resulting in the poisoning of the underlying bonded electrode” (*see* Cable at col. 1, ll. 58-68; col. 2, ll. 20-28). But because combinations of references that teach away from one another cannot support a *prima facie* case of obviousness, the combination of Cable with Isenberg is not a proper basis for a 35 U.S.C. § 103(a) rejection of the cited independent claims. *See* MPEP § 2145.X.D.2 (“It is improper to combine references where the references teach away from their combination.”) (citing *In re Grasselli*, 713 F.2d 731, 743 (Fed. Cir. 1983)). Accordingly, Cable and Isenberg may not be combined to support a rejection under 35 U.S.C. § 103(a).

The application of Cable to the present rejection is also improper on the additional ground that combining Cable with Isenberg would change the way in which Cable operates, and the MPEP makes clear that application of a reference in a way that changes the reference’s mode of operation is improper. *See* MPEP § 2143.01.VI. More specifically, Isenberg teaches an electrode that includes a skeleton material that allegedly binds metallic particles to an underlying electrolyte (*see* Isenberg at col. 3, ll. 67-68; *see also* Office Action at page 4). As described above, however, Cable explicitly *criticizes* the fabrication and use of Isenberg-type electrodes wherein an anode is ***bonded*** to an underlying electrolyte (*see* Cable at col. 2, ll. 20-28; col. 3, ll. 7-9). Accordingly, Cable teaches ***nonbonded*** electrodes wherein the anode is separated from the electrolyte by an interfacial layer.

The construction of the ***nonbonded*** Cable devices is exemplified by Cable **FIG. 1**, which figure is reproduced below for ease of reference:



As shown by this figure, the anode (4) is *separated* from the electrolyte (6) by an interfacial layer (19) (*see also* Cable at col. 7, l. 11 – col. 8, l. 34). Thus, because combining the *nonbonded* electrodes of Cable with the *bonded* electrodes of Isenberg would necessarily change the principle of operation of both references, and a *prima facie* case of obviousness cannot be supported by combining references in a way that changes the references' principle of operation. *See* MPEP § 2143.01.VI ("If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious") (citing *In re Ratti*, 270 F.2d 810 (CCPA 1959)). Accordingly, the combination of Cable and Isenberg is not a proper basis for the obviousness rejection of claims 64 and 67.

Furthermore, even if Isenberg and Cable were properly combinable – and Applicants do not concede this – the resulting device would fail to address every limitation of Applicants' claims 64 and 67. Combining Isenberg and Cable would result in a device having at most a porous coating layer – shown by item (15) of Isenberg **FIG. 3** – that is separated by an interfacial layer from an electrolyte. But such a device where a porous anode is separated from the electrolyte does not satisfy Applicants' claims 64 and 67, both of which require that the physical contact between the solid electrolyte and the composite anode comprising physical contact between the solid electrolyte and the porous ceramic of the composite anode. By contrast, the porous anode layer of an Isenberg-Cable combination would lack *any physical contact* with the electrolyte and could not satisfy these claim elements. (*See* Cable **FIG. 1**, which depicts an anode layer that is physically separated from the underlying electrolyte layer.) Accordingly, because the combination of Isenberg and Cable does not address every element of Applicants' claims 64 and 67, that combination fails to make out a *prima facie* case of obviousness, and the rejection of those claims should be reconsidered and withdrawn.

### III. CONCLUSION

For all of the foregoing reasons, Applicants submit that the rejections of the pending claims under 35 U.S.C. §§ 102(b) and 103(a) are improper in light of the cited prior art and should be withdrawn. Accordingly, Applicants respectfully request the Examiner to (1) enter



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**PATENT  
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the requested amendments to the claims; (2) reconsider and withdraw the pending rejections; and (3) pass claims 2-19, 21-30, 55, 56, 58, 60, and 62-67 to allowance.

Applicants respectfully submit that the present application is in condition for allowance. If the Examiner believes that additional communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided. Favorable consideration and an early notice of allowance are respectfully requested.

Date: August 6, 2008

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